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IDÉOTYPE SUD – RESULTS. FRANCE AND PORTUGAL COLLABORATES FOR THE CHARACTERIZATION OF WHEAT VARIETIES MORE TOLERANT TO WATER AND HEAT STRESS

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To fight against yield stagnation in bread and durum wheat, ARVALIS-Institut du végétal (France) and National Institute for Agrarian and Veterinarian Research (INIAV), Portugal, lead since 2012 variety trials reinforced on two stations: Gréoux (Paca region), France and Elvas, Portugal, subjected to important climatic constraints.

The extensive range of climatic conditions experienced since 2012 and the routine use of the Phénomobile, since 2016 in Gréoux, also made possible to use these trials as supports for methodological advances at the interface between broadband phenotyping, varieties and agronomic models. The complementarity of these agronomic and genetic innovative approaches opens the way to potential valorisation both in selection and in advice to producers on the choice of varieties in their environments.

A more refined characterization of the varietal characteristics related to the stress response was done. Senescence dynamics of the top leaves was evaluated by a portable equipment (greenseeker) or by phenomobile tool (NDVI). Results shows that yield performance of the varieties is strongly correlated with the date of the point of inflection of the senescence curve, either in rainfed or irrigated conditions.

Today, the precision of the achievements made by the Phénomobile makes possible to consider fine-tuning wheat development models by variety, through the varietal adjustment of the parameters used in the crop models (model ARVALIS CHN) and by realizing this, to phenotype on active variables in the CHN model more directly involved in wheat agronomic performance. Thus it is designed to refine the ideotype by mobilizing these resources.

As part of a future research program, the extension to other countries of the Mediterranean basin is envisaged with a start of collaboration with Tunisia, and partnerships in Italy.

Beyond breeder knowledge of the varieties (yield components, precocity, foliar port), the access to the hidden functional parameters of CHN allows to better know the varieties for adaptation to stress, to better advise, refining the varietal bouquet by environment, according to climatic scenarios.

ABSTRACT